Sub B1

WHAT IS CLAIMED IS:

1. A method for controlling at least one computing element with a universal console (UC), comprising:

storing a user's preferences for the universal console;

selecting a computing element to control with the UC;

receiving by the UC a canonical user interface (UI) representation of the computing element's UI;

instantiating a concrete UI by the UC taking into account the stored user preferences;

selecting at least one action-command to be carried out by the computing element;

transmitting to the computing element said data associated with said at least one action-command using a remote procedure call mechanism.

2. A method according to claim 1, wherein said selecting at least one action-command includes requesting information about the state of said at least one computing element.

3. A method according to claim 1, further comprising interacting with at least one group hierarchy to obtain data in connection with said selected at least one action-command to be carried out by the computing element.

4. A method according to claim 1, wherein said storing includes storing data indicating at least one disability of the user.

5. A method according to claim 1, further including carrying out said action-command by said computing element.

6. A method according to claim 1, further including receiving by the UC notifications from the computing element.

7. A method according to claim 6, wherein said notifications include at least one of an error message, warning message, status update message and state change.

8. A method according to claim 1, wherein said canonical UI representation is formatted according to an XML stream.

9. A method according to claim 1, further including requesting a list of available devices that may be controlled by UC.

10. A method according to claim 1, wherein communications between said UC and said computing element are made via Hypertext Transfer Protocol (HTTP).

11. A method according to claim 1, wherein said computing element is one from the group of a computing device and an application.

12. A method according to claim 1, wherein said remote procedure call mechanism makes calls according to SOAP (Simple Object Activation Protocol).

13. A method according to claim 1, wherein said canonical UI representation includes a representation associated with a parameter for choosing one element a from a set A.

14. A method according to claim 1, wherein said canonical UI representation includes a representation associated with a parameter for selecting a subset A' from a set A.

15. A method according to claim 1, wherein said canonical UI representation includes a representation associated with a parameter for selecting one from the group of True/False, Off/On, OK/Cancel and Yes/No.

16. A method according to claim 1, wherein said canonical UI representation includes a representation associated with a parameter for selecting an integer n in the range n_1 through n_2, with increment δ.

17. A method according to claim 1, wherein said canonical UI representation includes a representation associated with a parameter for selecting a real number x in the range x1 through x2, with increment δ.

18. A method according to claim 1,wherein said canonical UI representation includes a representation associated with a parameter type for an arbitrary string s.

19. A method according to claim 18, wherein said arbitrary string s is to be selected from a suggestion set of strings S.

20. A method according to claim 1, wherein said canonical UI representation includes a representation associated with a parameter type for the modification of a given first string s, resulting in a second string s'.

21. A method according to claim 1, wherein said canonical UI representation includes a representation associated with a parameter type for ordering the elements of set A into A'.

22. A method according to claim 1, wherein said canonical UI representation includes a representation associated with a parameter type for pairing set A elements with set B elements.

23. A method according to claim 1, wherein said canonical UI representation includes a representation associated with a group construct that contains at least one of commands and subgroups.

24. A method according to claim 1, wherein said canonical UI representation includes a representation associated with a command construct that specifies at least one action to send to the controlled element that will carry out the action-command.

25. A method according to claim 24, wherein said canonical UI representation includes a description of the parameters associated with the at least one action.

26. A computer readable medium bearing computer executable instructions for carrying out the method of claim 1.

27. A modulated data signal carrying computer executable instructions for use in implementing the method of claim 1.

28. A data structure formatted according to extensible markup language (XML) including data representative of a canonical UI description of a device to be controlled for use by a universal console.

29. A data structure according to claim 28, wherein said canonical UI description includes a representation associated with a parameter for choosing one element *a* from a set *A*.

30. A data structure according to claim 29, wherein said canonical UI description includes a representation associated with a parameter for selecting a subset *A'* from a set *A*.

31. A data structure according to claim 28, wherein said canonical UI description includes a representation associated with a parameter for selecting one from the group of True/False, Off/On, OK/Cancel and Yes/No.

32. A data structure according to claim 28, wherein said canonical UI description includes a representation associated with a parameter for selecting an integer n in the range n_1 through n_2, with increment δ.

33. A data structure according to claim 28, wherein said canonical UI description includes a representation associated with a parameter for selecting a real number x in the range x1 through x2, with increment δ.

34. A data structure according to claim 28, wherein said canonical UI description includes a representation associated with a parameter type for an arbitrary string s.

35. A data structure according to claim 34, wherein said arbitrary string s is to be selected from a suggestion set of strings S.

36. A data structure according to claim 28, wherein said canonical UI description includes a representation associated with a parameter type for the modification of a given first string s, resulting in a second string s'.

37. A data structure according to claim 28, wherein said canonical UI description includes a representation associated with a parameter type for ordering the elements of set A into A'.

38. A data structure according to claim 28, wherein said canonical UI description includes a representation associated with a parameter type for pairing set A elements with set B elements.

39. A data structure according to claim 28, wherein said canonical UI description includes a representation associated with a group construct that contains at least one of commands and subgroups.

40. A data structure according to claim 28, wherein said canonical UI description includes a representation associated with a command construct that specifies at least one action to send to the controlled element that will carry out the action-command.

41. A data structure according to claim 40, wherein said canonical UI description includes a description of the parameters associated with the at least one action.

42. A computer system wherein a user controls at least one computing element, said system comprising:

at least one computing element each having a canonical user interface (UI) description associated therewith; and

a universal console (UC) for controlling said at least one computing element and storing user preferences therein;

wherein a computing element of said at least one computing element communicates its associated canonical UI to said UC,

wherein said UC generates a concrete UI description from said canonical UI and said stored user preferences, and

wherein a user thereafter utilizes said UC to control said computing element via said concrete UI by selecting at least one action-command.

43. A computer system according to claim 42, wherein said selecting at least one action-command includes requesting information about the state of said at least one computing element.

44 A computer system according to claim 42, wherein a user of said UC interacts with at least one group hierarchy to obtain data in connection with said selected at least one action-command to be carried out by the computing element.

45. A computer system according to claim 42, wherein said storage of user preferences includes the storage of data indicating at least one disability of the user.

46. A computer system according to claim 42, wherein said at least one computing element carries out said at least one action-command.

47. A computer system according to claim 42, wherein said UC receives notifications from the at least one computing element.

48. A computer system according to claim 47, wherein said notifications include at least one of an error message, warning message, status update message and state change.

49. A computer system according to claim 42, wherein said canonical UI description is formatted according to an XML stream.

50. A computer system according to claim 42, wherein said selecting at least one action-command includes requesting a list of available devices that may be controlled by UC.

51. A computer system according to claim 42, wherein communications between said UC and said computing element are made via Hypertext Transfer Protocol (HTTP).

52. A computer system according to claim 42, wherein said computing element is one from the group of a computing device and an application.

53. A computer system according to claim 42, wherein said remote procedure call mechanism makes calls according to SOAP (Simple Object Activation Protocol).

54. A computer system according to claim 42, wherein said canonical UI description includes a description associated with a parameter for choosing one element *a* from a set *A*.

55. A computer system according to claim 42, wherein said canonical UI description includes a description associated with a parameter for selecting a subset A' from a set A.

56. A computer system according to claim 42, wherein said canonical UI description includes a description associated with a parameter for selecting one from the group of True/False, Off/On, OK/Cancel and Yes/No.

B1

57. A computer system according to claim 42, wherein said canonical UI description includes a description associated with a parameter for selecting an integer n in the range n_1 through n_2, with increment δ.

58. A computer system according to claim 42, wherein said canonical UI description includes a description associated with a parameter for selecting a real number x in the range x1 through x2, with increment δ.

59. A computer system according to claim 42, wherein said canonical UI description includes a description associated with a parameter type for an arbitrary string s.

60. A computer system according to claim 59, wherein said arbitrary string s is to be selected from a suggestion set of strings S.

61. A computer system according to claim 42, wherein said canonical UI description includes a description associated with a parameter type for the modification of a given first string s, resulting in a second string s'.

62. A computer system according to claim 42, wherein said canonical UI description includes a description associated with a parameter type for ordering the elements of set A into A'.

63. A computer system according to claim 42, wherein said canonical UI description includes a description associated with a parameter type for pairing set *A* elements with set *B* elements.

64. A computer system according to claim 42, wherein said canonical UI description includes a description associated with a group construct that contains at least one of commands and subgroups.

65. A computer system according to claim 42, wherein said canonical UI description includes a description associated with a command construct that specifies at least one action to send to the controlled element that will carry out the action-command.

66. A computer system according to claim 65, wherein said canonical UI description includes a description of the parameters associated with the at least one action.